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NUCLEAR WASTE MANAGEMENT PROGRAM PROCEDURE

NP 20-1
TEST PLANS
Revision 3

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	(printed name)	(signature)	date

1.0 Purpose and Scope

This procedure prescribes the requirements for preparing, approving, revising, and implementing Test Plans (TPs) used in data collection (i.e., laboratory or field) conducted for the Sandia National Laboratories (SNL) Nuclear Waste Management Program (NWMP).

This procedure applies to the planning and documentation of:
- field and laboratory experiments, and
- testing and experimental activities that produce data.

The scope of this procedure addresses the requirements for preparation and use of TPs, and applies to NWMP staff, suppliers, and others who plan, prepare, conduct, and oversee scientific investigations for the NWMP and work to the NWMP Quality Assurance (QA) Program.

Acronyms and definitions for terms used in this procedure may be found in the NWMP Glossary located at the Sandia National Laboratories (SNL) NWMP On-line Documents web site.

2.0 Implementation Actions

2.1 General Requirements

TPs are written to ensure that a scientific activity (or activities) is accomplished under suitable, controlled conditions. The author of a TP shall either be the principal investigator (PI) or be selected by the PI or the manager responsible for the work activity. TPs are approved prior to initiation of work, and describe the scientific activity in sufficient detail to allow the test or experiment to be conducted.

The PI shall ensure that the scientific activity is planned, documented, reviewed, and approved through review and approval of the TP. The content requirements for TPs are listed in Appendix A.

Note: Use of National Standards. When reference standards are used without modification, the TP will document the standard by reference only. If deviations from test standards or the establishment of specially prepared test procedures is deemed appropriate (e.g., no nationally recognized test standards exist) the modified or new test procedures shall be documented in sufficient detail to be repeatable, and shall be justified, evaluated, and approved by the cognizant technical organization. The differences will either be defined in the TP, or documented as a Activity/Project Specific Procedure (SP), reference NP 5-1 (Implementing Procedures), or documented by using a Scientific Notebook (SN), reference NP 20-2 (Scientific Notebooks), whichever is appropriate.

2.2 Format

2.2.1 The cover page of the TP shall include the following:

- "Test Plan"
- TP number assigned by Document Control
- TP Title
- Author(s) Name(s), Organization(s)
- Revision Number
- Effective Date: _____
- NWMP Records Center File Code

Note: Both the TP number and the effective date are assigned by the SNL NWMP Document Control Staff. The first issue of a TP is “Revision 0”.

2.2.2 Document Control Header. Each page of a TP shall bear the following document control header, located in the upper right-hand side of the page:

TP (number)
Revision (number)
Page (number) of (total number)

2.2.3 Content The required content of the TP is described in Appendix A.

2.3 Test Plan Review and Approval Process

The author shall:
- Obtain a TP control number from the SNL NWMP Document Control Staff,
- Prepare the text of the TP in accordance with Appendix A, and
- Forward the draft TP to the assigned reviewers.

Reviewers shall:
- Review the TP according to NP 6-1 (Document Review Process).
- Verify that the TP meets the requirements of this procedure, including Appendix A.

The following are the minimum required approval signatures:
- Technical reviewer,
- QA reviewer
- responsible NWMP manager

The PI may add additional reviewers as necessary, for example:
- customer and/or contractor required reviews
- safety reviews (lab or field)

Reviewers and authors shall sign the TP or revision. The required signatures and applicable Document Review and Comment forms (DRC) indicate that the TP or revision was reviewed, review comments were satisfactorily resolved and incorporated, and the TP or revision is approved for use, subject to its effective date.

2.4 Changes to Test Plans

The author shall ensure revisions to the Test Plan are clearly indicated with vertical change bars in the margin of the revised plan (Note: change bars will indicate changes for the current revision only). Changes to TPs shall be made in accordance with NP 6-1.

2.5 Issuance and Control

Controlled documents shall be issued in accordance with NP 6-2 (Document Control Process).

2.6 Test Plan Implementation

The Sandia PI or designee shall:

- Oversee implementation of the TP.
- Revise the TP, as necessary.
- Oversee preparation of TP Data Record.
  A TP Data Record shall provide sufficient documentation so a qualified technical person independent of the work could reconstruct the work and reproduce the results of the corresponding TP. The data shall be identifiable and traceable to the test or source and controlled to avoid loss and ensure retrievability (See Appendix B for guidance).
- Ensure both a Technical and QA review of those elements of the TP Data Record that have not previously been reviewed as part of another procedure/process.
- Submit the completed TP Data Record to the NWMP Records Center.

3.0 Records

The following QA records, generated through implementation of this procedure, shall be prepared and submitted to the NWMP Records Center in accordance with NP 17-1 (Records).

QA Record	Preparer	Records Submitter
• The final, approved new/revised TP	Author	Author
• DRC forms (NP 6-1-1), if required	Author and Reviewers	Author
• TP Data Record (per Appendix B)	PI	PI

4.0 Appendices

Appendix A: Test Plan Content
Appendix B: TP Data Record Guidance
Appendix C: TP Flow Chart

Appendix A
Test Plan Content

Test Plans (TPs) shall include the following, unless the nature of the work does not involve the item or concept:

- **Title and Header Information** - See format in Section 2.2.
- **Approvals** - Provide the name, title, and dated signatures of persons approving the TP, including the author and reviewers (technical, QA and management)**.**
- **Table of Contents** - Provide an outline of the TP contents and the corresponding pages at which the sections start.
- **Revision History** - Describe the purpose and content of each revision made.
- **Purpose and Scope** – Describe the purpose and scope of the scientific activity (hypothesis or hypotheses to be tested), and the intended use of the data.
- **Experimental Process Description** – Describe the primary tasks and the conduct of the scientific investigation activity, addressing the following (note: if specifics are not known, describe how they will be documented during the scientific investigation activity):

  ⇒Planning Overall Strategy and Process

  - Critical variables to be measured and controlled
  - Coordination with organizations providing inputs or using the results
  - Procedures to be used/developed
  - Identification of prerequisites, special controls (including controls to prevent tampering of data during acquisition and analysis), specific environmental conditions, processes, or skills.
  - Known sources of error and uncertainty including any uncertainty about the quality of input data
  - Compatibility of data processing with any conceptual/mathematical models used at each applicable stage
  - Specify documents to be maintained as QA records (e.g., scientific notebooks)

  ⇒Sample Control

  - Sample labeling/identification method to be used (e.g., as described/recorded in scientific notebook)
  - Sample handling/nonconforming requirements - reference NP 13-1 (Sample Control)
  - Sample storage and/or environmental controls
  - Sample disposal

  ⇒Data Quality Control

  - Measuring and Test Equipment (M&TE) - reference NP 12-1 (Control of Measuring and Test Equipment)
    - calibration requirements
    - use of M&TE, standards, and other tools
  - Data Acquisition System (DAS)
    - For the intended use, identify required periodic in-use manual or automatic self-check routines (e.g., visual data inspection, established alarm interval limits, calibrated source)
    - For commercial software not modified, document the name, version and the hardware for which it is used
    - For developed or modified stand alone software (i.e., software which can be operated and verified independent of the hardware system), refer to NP 19-1 for qualification
  - Methods for justification, evaluation, approval, and documentation of any deviations from test standards or of establishment of specially prepared test procedures (e.g., when no nationally recognized test standards exist)
  - Controls/reference sample use (e.g., use of replicates, spikes, split samples, control charts, blanks, reagent checks, etc., as appropriate)
  - Control and characterization of test media (e.g., fluids)

⇒Data Identification and Use
- Method(s) of recording data (e.g., scientific notebook, log books, data sheets)
- Data transfer and reduction controls
- Control of erroneous or inadequate data (includes identification, segregation, and disposition)
- Data conversion controls

- **Training –**Identify special training requirements, if applicable (reference NP 2-1, Qualification and Training).
- **Health and Safety** – Describe any unique health and safety hazards associated with this work, and describe specific requirements and procedures to mitigate impact.
- **Permitting/Licensing** – Discuss special permitting or licensing requirements which may be required to conduct the scientific activity (e.g., state permit to drill wells).
- **References** – List documents referenced in the TP in sufficient detail (e.g., author, journal name, publish date) to allow copies to be obtained by the reader.

Appendix B
TP Data Record Guidance

The following format is offered as guidance to improve the quality and consistency of these records. The content listed below should be provided unless the nature of the work does not involve the item or concept.

(NOTE: The purpose of the TP Data Record is not to duplicate documentation in the Records Center, but rather provide a pointer to where information relevant to implementation of the TP can be located.)

ITEM	AREA	CONTENT
1	PLAN OF WORK	• Test Plan and any revisions • Letters of direction.
2	TEST METHODS/ PROCEDURES	• Quality Assurance Procedures and/or Programs in effect during the period the work was performed. • Technical procedures used to perform work (e.g., test procedures, sample preparation). • Documents supporting how the testing was done. • Equipment operating instructions, test procedures, sample preparation procedures, etc.
3	PERSONNEL	• List personnel involved in performing the work and their associated tasks.
4	CONSTRUCTION RECORDS (Generally for Field Experiments)	• Include pertinent records pertaining to mining, drilling, surveys,drawings, sketches
5	EQUIPMENT DESCRIPTION	• Identification/location of measurement and test equipment used (include standards, certifications, as well as data acquisition instrumentation) • Include supporting photos, drawings, serial and/or model numbers, etc.
6	SAMPLE DESCRIPTION/ HANDLING	• Identification of samples used during the data collection process, and any documentation not previously submitted under NP 13-1 (e.g., photos, logbooks).

7	DATA ACQUISITION SYSTEM	• Identification of software. Note: See NP 19-1 for qualification requirements and NP 17-1 for record submittal requirements.
8	DATA RECORDS	• Identify the raw data and the location of any records which accompany or support the raw data • Documentation of the traceability of the data manipulation process from raw data to the reduced data tables, graphs in the final report. • Identification of the reduced data and a description of how it was done (e.g., software). • Location of the final data • Forms (e.g., gage installation, brine volume) • Lab notes, scientific notebooks, calculations, lab sheets, etc. (Note: sort by test identifier, such as test date, solution number; sample used, etc…)
9	REPORTS	• Associated plans (e.g., Analysis Plans), SAND Reports, publications, etc., referenced in the TP or used to support or report the work performed. Include contractor status/final reports.
10	CORRESPONDENCE	• Additional records of correspondence, interactions, etc. that provide further evidence of the quality of the data. (Note: where correspondence may be applicable to multiple sections, place the correspondence in one section and cross-reference the other sections)

Appendix C
TP Flowchart